High-Performance Airborne Optical Carbon Dioxide Analyzer, Phase I

Completed Technology Project (2008 - 2008)

Project Introduction

Environmental species measurement on airborne atmospheric research craft is a demanding application for optical sensing techniques. Yet optical techniques offer many advantages including high-precision, fast response, and high species selectivity. Balloonsonde, kite, unmanned aerial vehicle (UAV), or glider deployment demands that sensors meet stringent size, weight and power requirements. Few measurements are as important, and none have entered into the public consciousness, like the need to quantify global carbon dioxide loading. Vista Photonics proposes to develop rugged, compact, power efficient optical sensor technology capable of selectively measuring atmospheric carbon dioxide with precision that rivals ground based instruments. The enabling technology for meeting stringent NASA mission requirements is a newly emergent infrared laser source that delivers the high-sensitivity of established optical absorption detection techniques with extreme compactness and low power draw.

Anticipated Benefits

Potential NASA Commercial Applications: Phase III commercial applications abound for sensors whose performance and physical characteristics are suitable for unmanned airborne measurements. Examples include contaminant monitoring in process gas streams in the chemical and microelectronics industries, medical diagnosis through detection of biogenic gases in human breath that correlate to specific pathologies, and environmental monitoring and regulatory compliance in agriculture, power production, and occupational safety. The fully-developed Phase II instruments shall offer a compelling and desirable blend of performance, affordability, compactness, simplicity and ease-of-use relative to present commercial product offerings in these applications.

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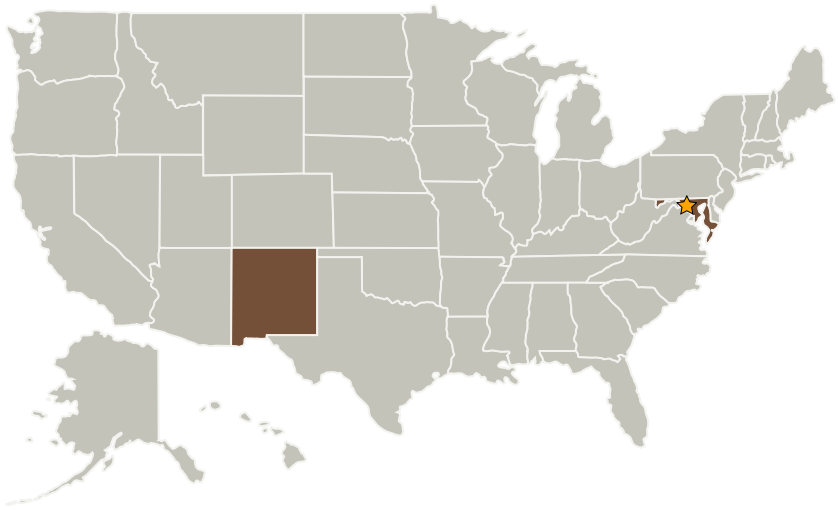
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Vista Photonics, Inc.	Supporting Organization	Industry	Santa Fe, New Mexico

Primary U.S. Work Locations	
Maryland	New Mexico

Project Transitions

January 2008: Project Start

July 2008: Closed out

Closeout Summary: High-Performance Airborne Optical Carbon Dioxide Analyzer, Phase I Project Image

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

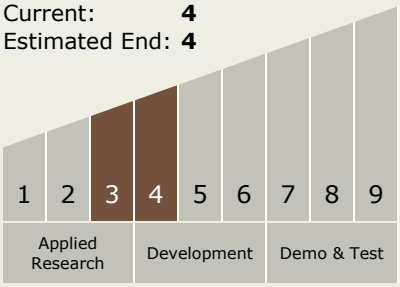
Carlos Torrez

Principal Investigator:

Jeffrey Pilgrim

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.4 Environment Sensors